C7600A
Solid State Humidity Sensor

FEATURES

• **Long-lasting solid state sensing element is accurate and stable over time.**

• **Sensor enclosed in rugged glass-fiber reinforced plastic case.**

• **Compact size and lightweight construction for easy mounting in duct or on wall.**

• **Vents in top of cover allow air flow to internal humidity sensing element.**

• **4 to 20 mA output inversely proportional to relative air humidity.**

• **Can be used indoors or outdoors.**

GENERAL

The C7600A Solid State Humidity Sensor senses the relative humidity of the return air and is used with the W7600 Multifunction Controller or any controller capable of processing a 4 to 20 mA signal.

Contents

SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, an individual unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions and some minor differences in performance can be expected if those conditions are changed.

Model:

C7600A Solid State Humidity Sensor. Use with W7600 Multifunction Controller or any controller capable of processing 4 to 20 mA signal.

Electrical Ratings:

Input:
18 to 24 Vdc.
Output:
4 to 20 mA current signal; increases from 4 to 20 mA as humidity decreases. The relationship of the C7600A output current vs. relative humidity is shown in Fig. 2. It is not possible to develop a straight-line formula for calculating the C7600A current output from a given relative humidity; however, the exponential formula below gives accurate results for this relationship.

$$I = 19.12925 - 0.1507896RH + 1.720302(10^{-4})RH^2 - 1.598528(10-7)RH^3$$

Where:
I is the current output of the C7600A in mA.
RH is the percent relative humidity.

Maximum Power Consumption: 0.48 VA.

Ambient Temperature Ranges:

Operating:
32°F to 125°F (0°C to 52°C).
Shipping:
-40°F to +150°F (-40°C to +66°C).

Humidity Range:

10 to 90 percent relative humidity.

Humidity Sensitivity:

+/- 3 percent.

Humidity Sensing Element:

Polyamide film (capacitance changes with change in humidity).

Case:

Compact, rugged, lightweight plastic case.

Mounting:

Duct-mounted indoors, or wall-mounted outdoors in a location protected from rain, snow, or direct sunlight.

Terminals:

Two 1/4 in. (6 mm) quick-connect terminals.

Dimensions:

See Fig. 1.

Time Constants:

Airflow: 500 fpm.
Time: 15 minutes.

Approvals:

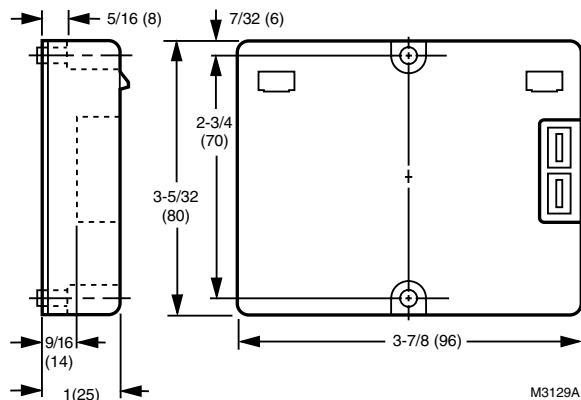Underwriters Laboratories Inc.: Flammability rating UL94-5V.

Fig. 1. C7600A Solid State Humidity Sensor dimensions in in. (mm).

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:
1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations
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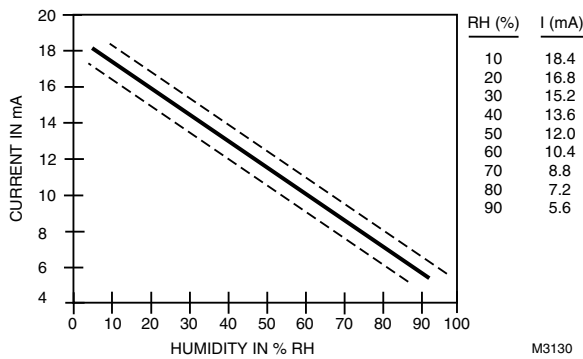
Fig. 2. C7600A output current vs. relative humidity.

RH (%)	I (mA)
10	18.4
20	16.8
30	15.2
40	13.6
50	12.0
60	10.4
70	8.8
80	7.2
90	5.6

INSTALLATION

When Installing this Product…

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. Checkout according to instructions provided with the controller before leaving installation.

⚠ CAUTION

Disconnect power before installation to prevent electrical shock or equipment damage.

Location

When selecting the location, make certain that the humidity sensor is not exposed to rain, snow, or direct sunlight. The C7600A Solid State Humidity Sensor is designed to operate in 500 ft/min minimum airflow.

Mounting

The C7600A Solid State Humidity Sensor can be mounted in any position; however, the sensor must be installed where it is exposed to freely circulating air, with at least 500 ft/min airflow.

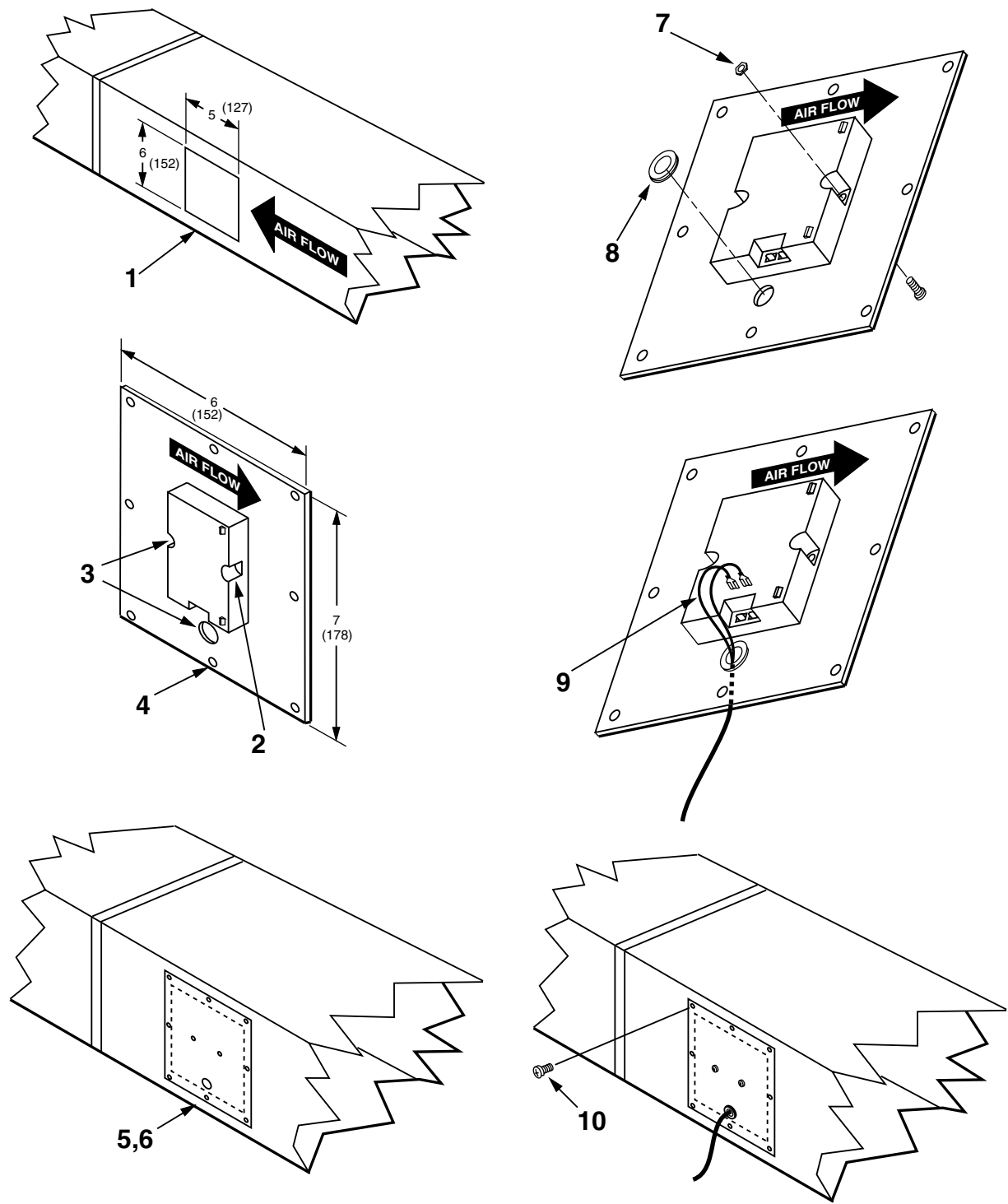### Mounting the C7600 Solid State Humidity Sensor Outdoors

❶ Select a location protected from rain, snow or direct sunlight.

❷ Attach the sensor to the wall with two 1/8 in. (3 mm) diameter screws.

❸ Wire as shown in the Wiring section.

Installing C7600 Solid State Humidity Sensor in Return Air Duct (See Fig. 3)

NOTE: Installers need to supply the following: sheet metal cutter or snips; drill with 1/16 in. (2 mm), 1/8 in. (3 mm) and 1/2 in. (13 mm) bits; screwdrivers; 1/2 in. (13 mm) rubber grommet; eight self-tapping sheet metal screws; and two 1/8 in. (3 mm) by 3/4 in. (19 mm) machine screws with lockwashers and nuts.

❶ Cut a 5 in. (127 mm) by 6 in. (152 mm) rectangular hole in one side of the return air duct.

❷ Center the sensor on a 6 in. (152 mm) by 7 in. (178 mm) piece of sheet metal. Mark locations for mounting screws and for a hole for the control wire.

❸ Drill two 1/8 in. (3 mm) mounting holes for the sensor and one 1/2 in. (13 mm) hole for the control wire.

❹ Drill eight starting holes in the sheet metal rectangle for self-tapping sheet metal screws.

❺ Center sheet metal rectangle over opening in duct so there is a 1 in. (25 mm) overlap on all four sides. Then mark the eight sheetmetal screw locations on the duct.

❻ Drill eight starting holes in the duct for self-tapping sheet metal screws.

❼ Attach sensor to sheet metal rectangle with 1/8 in. (3 mm) by 3/4 in. (19 mm) machine screws, washers and nuts. Attach the machine screws from the outside of the sheet metal to eliminate protrusions and possible sharp edges.

❽ Place a rubber grommet in the 1/2 in. (13 mm) hole in the sheet metal to protect the control wires from abrasions.

❾ Put the control wires through the 1/2 in. (13 mm) hole and wire as shown in the Wiring section.

❿ Attach the sheet metal rectangle to the duct with self-tapping sheet metal screws. Make sure that airflow over the sensor is as shown in Fig. 3.

M5242A

Fig. 3. Installing C7600A Solid State Humidity Sensor in return air duct.

Wiring

Disconnect the power supply before beginning wiring to prevent electrical shock or equipment damage. All wiring must comply with applicable codes and ordinances. Follow the wiring information furnished by the controller manufacturer or refer to Fig. 4 for a typical wiring hookup. Note and follow polarity markings for hookup.

OPERATION

The C7600A Solid State Humidity Sensor provides a 4 to 20 mA output signal that is inversely proportional to the relative humidity of the return air.

The sensing element in the C7600A Solid State Humidity Sensor is a humidity-sensitive polyamide film that changes capacitance with a change in humidity. This change in capacitance is converted by a printed circuit board assembly to an output current between 4 and 20 mA. The output current is used by an analog or a microprocessor-based controller to measure and control humidity.
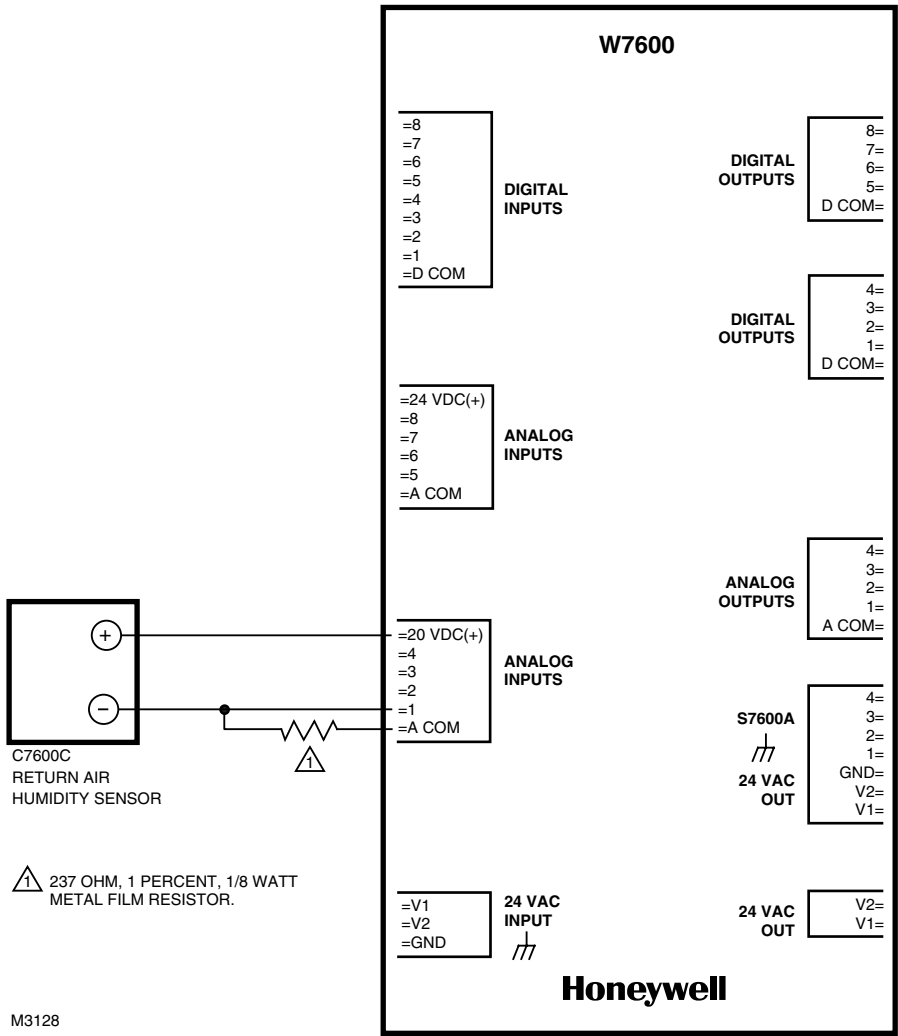

Fig. 4. Wiring C7600A Solid State Humidity Sensor to W7600.

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